February 18, 2025

FINANCIAL ASSISTANCE CENTER
FINDING OF NO SIGNIFICANT IMPACT/ENVIRONMENTAL ASSESSMENT

TO: ALL INTERESTED GOVERNMENT AGENCIES AND PUBLIC GROUPS

In accordance with procedures for environmental review found at 10 CSR 20-4.050, the Department has performed our review on the proposed action below:

PROJECT INFORMATION:

Project Identification: Jackson Wastewater Treatment Plant Improvements Project

Applicant: City of Jackson Project No.: C295861-01

City: Jackson County: Cape Girardeau State: Missouri

Total Project Amount: $10,100,000.00

Total Clean Water State Revolving Fund Eligible Costs: $10,100,000.00

- Potential Loan: $10,100,000.00
- Potential Grant: $ 0.00

COMMUNITY DESCRIPTION:

Location: The city of Jackson is located in central Cape Girardeau County, northeast of the City of Cape Girardeau, in the southeast corner of the State of Missouri. The Jackson Wastewater Treatment Facility (WWTF) is located to the south of the city of Jackson, east of the terminus of Lee Avenue.

Population, Present and Projected, and Design Year: The design population for the Jackson WWTF is 17,900. The 2015 population for Jackson, as identified in the Facility Plan, was estimated at 14,869. The 20-year projected population is estimated at 18,963.

Current Methods of Waste Treatment: The existing Jackson WWTF includes the following components:

- A facility headworks including bar screen, screw-type lift pumps, a grit removal chamber, and a comminutor
- Two oxidation ditches, with surface aerators
- Three circular clarifiers

- An aerobic digester and sludge storage tanks
- Ultraviolet disinfection system
- Effluent lift station prior to discharge

PROJECT DESCRIPTION:

Purpose and Need: The proposed project is the first phase of improvements for the Jackson WWTF to address issues present in the existing treatment facility and collection system. While the treatment plant has sufficient hydraulic capacity for a 20-year flow projection, upgrades are needed to help the plant manage the projected organic loadings that are estimated in the 20-year flow projection, reduce the energy consumption of the treatment plant, address potential bottlenecks present in the treatment train, replace aging infrastructure to extend the useful life of the treatment facility, bring existing structures up to date with current code, and improve the ease of operation of the facility for plant operators.

Description of Project: The proposed project will include the following components as part of the first phase of upgrades for the Jackson WWTF:

- Installation of a membrane sludge thickening system to improve sludge management without requiring chemical addition or mechanical equipment.
- Improvements to the existing influent screen building to ensure compliance with applicable NFPA standards.
- Installation of supervisory control and data acquisition (SCADA) for plant monitoring and data collection.
- Implementation of structural improvements for the existing treatment units to bring the facility up to code.
- Installation of aeration disk systems in existing oxidation ditches to reduce energy usage at the plant.
- Installation of a new weir in the existing splitter box.
- Installation of a mag meter and vault between the headworks and pumps.

Additionally, the following parts of the project are also planned for the first phase of construction for the facility but will be bid alternates in case the bids exceed the currently allocated funding.

- Construction of a new administration control building, and the expansion of the electrical room in the existing building.
- Replacement of worn flights on the existing screw pumps.
- Improvements to the clarifiers to modify the scum removal process, including installation of scum beaches, rehabilitation of rake mechanisms, and replacement of telescoping valves.

Design Factors: The average design flow for the Jackson WWTF is 2.43 million gallons per day (MGD), with an average actual flow of 1.73 MGD. The design sludge production rate is 376 dry tons/year. The organic loading rate for the facility is 3,220 lb biochemical oxygen demand (BOD) per day. The 20-year flow projection for the facility has an estimated design average flow at 2.4 MGD, with an estimated organic loading rate of 3,500 lb BOD/day. The

proposed project will include improvements to ensure the facility can manage these estimated flow increases in the long term.

Receiving Stream: The receiving stream for the Jackson WWTF is Goose Creek, which has the following designated beneficial uses: protection of aquatic life, whole body contact recreation, secondary contact recreation, human health protection, irrigation for use on crops utilized for human or livestock consumption, and livestock and wildlife watering.

ALTERNATIVES CONSIDERED:

Collection Systems:

Not Selected – Numerous collection system alternatives were considered as potential options to consider for the first phase of work for upgrading the City of Jackson's treatment works, including replacement of existing lines to address pipe capacity issues, construction of new lines that would reroute wastewater flow and eliminate some problematic portions of the existing collection system, and work focused on inflow and infiltration reduction. However, none of those alternatives were ultimately selected to be a part of the first phase of work for upgrades for the City of Jackson, and thus will not be discussed in detail.

Wastewater Treatment:

Not Selected – Alternative No. 1 considers upgrading the sludge thickening process for the Jackson WWTF by installation of a floating decanter system in the digestion tanks at the facility. The decanting process utilized would be the same as what is currently used at the Jackson WWTF but would allow for more flexibility in decanting operations. This will allow for decanting two feet below the existing valves. However, this alternative requires aeration to be stopped to allow for extra time for sludge blanket settling, which adds additional retention time and keeps the alternative from being viable, so it was not explored further.

Not Selected – Alternative No. 2 looks at upgrading the sludge thickening process via the use of a gravity thickener between the waste sludge line and the sludge pump suction piping. The gravity thickener acts as an additional clarifier with smaller diameter that helps the sludge collection, with piping to connect the thickener to the existing sludge and return lines to ensure continuous operation. This alternative does present an issue related to challenges in properly maintaining influent alkalinity, due to the thickening occurring prior to digestion. To address this, denitrification can be added as a part of the treatment process, but accomplishing this would lead to irregular periods of operation, which presents other potential treatment train issues. As a result, technical issues kept this alternative from being explored further.

Not Selected – Alternative No. 3 suggests addressing the sludge thickening process by utilization of a rotary drum mechanical thickener system. This alternative utilizes a cylindrical screen for separating the solid sludge from the water, while rotating the drum to prevent buildup on the screening area itself. This alternative will require the installation of upgraded electrical components for operation. The original 2017 estimated

capital cost was $1,462,808 but had significantly higher O&M costs compared to Alternative No. 5, which lead to the alternative not being selected, and was not reevaluated in the future for revised project costs.

Not Selected – Alternative No. 4 proposes utilizing a disk thickener mechanical thickening process for sludge processing. Disk thickeners use a rotating disk screen for gravity separation and would involve the construction of a prefabricated building between the existing digestion tanks and would allow for flexibility with the ability to alter intake from either digestion tank or recirculate thickened sludge for blending. The original 2017 estimated capital cost was $1,527,549, which lead to the alternative not being selected, and was not reevaluated in the future for revised project costs.

Selected – Alternative No. 5 considers membrane thickened aerobic digestion (MEMTAD) for sludge management. This alternative can be fully automated, using membranes for solids thickening to reduce interruption of the treatment process, as the permeate produced as a result of the sludge management will still be able to flow continuously. This alternative has the option for side stream treatment to account for future nutrient criteria. This alternative was later updated to include additional upgrades for the facility, including expansion of the digester equipment building, the replacement of the existing blowers with better operability, and a fine screen structure to help protect sludge thickening equipment. The original 2017 estimated capital cost was $1,703,088, with a revised estimate in 2024 updating the cost of the membrane thickening system to $3,675,000. However, the original estimates for all three sludge thickening alternatives did not account for the costs of expanding the digester equipment building, replacing the digester blower, and addition of a fine screen structure, which were later added into this alternative, resulting in a final cost estimate of $4,848,140.

Selected – Alternative No. 6 proposes upgrading the oxidation ditch by installing an orbal disk surface aeration system to upgrade the current brush rotor system. The disk surface aerator system is capable of operating nitrification and denitrification simultaneously. New blowers and electrical power will need to be installed for operation of the disk surface aeration system. The original 2017 estimated capital cost was $1,264,138, which was later updated in 2024, resulting in a final cost estimate of $1,972,000.

Not Selected – Alternative No. 7 looks at installation of a floating surface aerator system to replace the brush rotor system for the oxidation ditch. This option uses a blower for aeration and then injects to a submersed impeller for mixing, keeping the two processes separate. The brush rotors will be replaced by the floating aerators, while the bridges can be used for mounting the blowers. This alternative also will require the routing of new electrical service for operation and would be the most energy-intensive of the explored oxidation ditch modification options. The original 2017 estimated capital cost was $2,041,005, which was considered cost prohibitive compared to Alternative No. 6, so this option was not selected or reevaluated when updating costs.

Not Selected – Alternative No. 8 considers using fine bubble diffused air aeration as a replacement for the brush rotor system installed in the oxidation ditch treatment system. The fine bubble diffusers would be implemented in the oxidation ditches as a grid, with blowers and mixers being installed for operation and alterations for electrical work being implemented as well. The original 2017 estimated capital cost was $2,007,733, which was considered cost prohibitive compared to Alternative No. 6, so this option was not selected or reevaluated when updating costs.

Selected – Alternative No. 9 covers a variety of proposed smaller tasks to improve plant operation and address some aging infrastructure not addressed in other alternatives. This work includes implementation of influent monitoring by the installation of a mag meter and vault between the headworks and pumps, rehabilitation of the screw pump flights that are worn from aging, rehabilitation of the clarifier structures via sandblasting, recoating, and installation of a scum removal system, installation of a new weir in the splitter box, and implementation of SCADA in the treatment plant for improved operability. The original 2017 estimated capital cost was $2,018,000, which was updated in 2024 to a total estimated cost of $2,303,200.

Selected – Alternative No. 10 proposes modifications to the influent screen building to bring the building up to code. Specifically, since the building is designated as a Class 1 Div 1 area, electrical equipment and appurtenances must be replaced with explosion-proof versions. This includes the installation of explosion-proof lighting and a unit heater to allow for proper lighting and freeze protection. This will also lead to the screen control panel and composite sampler being placed in an unclassified prefab building that will be adjacent to the influent screen building. The original 2017 estimated capital cost was $86,000, with a revised cost estimate from 2024 of $135,500.

Not Selected – Alternative No. 11 suggests pursuing an antidegradation review that would monitor and study Goose Creek for the purpose of reclassifying it to a P stream. This process will require 10 years of flow data to justify a reclassification, which would allow for a mixing zone to be established as a part of the effluent discharge for the facility. This alternative does not have an estimated capital cost.

Not Selected – Alternative No. 12 is a possible extension of Alternative No. 6, looking at adding full Biological Nutrient Removal (BNR) to a disk surface aeration system to account for nitrogen and phosphorus removal to address future potential limits that will are anticipated in the future. The disk aeration process has nitrification-denitrification processes, but an anaerobic tank with an internal recycle pump would be added to address phosphorus, while also maximizing nitrogen removal via nitrate recycling to the anoxic zone. The estimated capital cost from 2017 was $475,550, but with a BNR alternative not being selected for the facility at this time, this option was not reevaluated for updated cost in later estimates.

Not Selected – Alternative No. 13 looks at adding BNR to Alternative No. 7, which was surface aeration. This alternative would include the addition of an anaerobic tank for phosphorus treatment. Additionally, an extra surface aerator would need to be added to each oxidation ditch to ensure the proper establishment of anoxic zones in the treatment process to address nitrogen limits. The estimated capital cost is $539,838, but with a BNR alternative not being selected for the facility at this time, this option was not reevaluated for updated cost in later estimates.

Not Selected – Alternative No. 14 covers the addition of BNR to the fine bubble diffuse air treatment proposed in Alternative No. 8. For nitrogen treatment, the only upgrade needed would be to the controls system to ensure proper establishment of anoxic and aerobic zones, as the aeration being utilized will be able to perform that work as is. Additionally, DO probes would be utilized to monitor these zones. Additionally, an anaerobic tank would be added for phosphorus treatment. The estimated capital cost is $112,216, but with a BNR alternative not being selected for the facility at this time, this option was not reevaluated for updated cost in later estimates.

Selected – Alternative No. 15 looks at constructing a new administration building at the treatment facility, to provide more space for process operations. Limited storage space has led to the existing building becoming overcrowded, and the age of the building will require upgrades to bring it up to code as an administration building. As a result, this alternative suggests constructing a new building to house an office space, meeting room, and lunchroom on site, while then converting the existing building into designated storage space and an electrical room. The original 2017 estimated capital cost was $570,000, with a 2024 update to the cost estimate placing the estimated capital cost at $1,056,030.

Not Selected – Alternative No. 16 suggests conducting a floodplain review of the treatment facility site, to help address existing issues stemming from flooding that occurs on the roadway entering the facility. The hope is that in conducting a review of the floodplain, the source of the flooding can be identified, and proper techniques can be utilized to better protect the facility. The original 2017 estimated capital cost was $20,000, but this alternative was not selected to be pursued in Phase I, so it was not evaluated further.

Not Selected – Alternative No. 17 presents the no-discharge alternative. For the flow rate of the existing facility, it was estimated that 340 acres would need to be acquired to account for current and future flows for land application alone. This assumption also was made using a basis of 100-inches of application per year, which is likely very optimistic. If the more typical 24-inch maximum application rate were used, 1,400 acres would need to be acquired, and additional storage capacity would possibly be needed for minimum requirements on holding capacity. The land requirements alone lead to this being a non-feasible alternative.

Not Selected – Alternative No. 18 briefly reviewed regionalization. The closest option that could manage the Jackson WWTF flows would be the Cape Girardeau Municipal WWTF, which would require 12 miles of force main and likely multiple pump stations to maintain the flow through the varied terrain between the two sites. These factors led to this alternative not being feasible.

Not Selected – Alternative No. 19 evaluated decentralization as an option for the Jackson WWTF. This option was very quickly determined to not be worth pursuing, as the existing treatment facility would have to be decommissioned and multiple community facilities would need to be constructed, so ultimately this option would lead to multiple issues without major benefits when the infrastructure already exists.

REASONS FOR SELECTION OF PROPOSED ALTERNATIVE:

Alternative Nos. 5, 6, 9, 10, and 15 were selected to provide general improvements to the existing treatment facility, bringing the facility up to code, improving the existing treatment methods, and upgrading overall operability, which will make future upgrades for the facility easier to implement.

ENVIRONMENTAL IMPACT SUMMARY:

1. Primary:
   a. Construction: Temporary surface disruption, blowing dust, and noise from vehicles and equipment will occur during construction, but the City of Jackson expects these impacts to be minor and temporary in nature.

   b. Environmental: This project will improve the operability of the Jackson WWTF, replacing outdated equipment and bringing the facility up to code, which should result in improved facility operability and better effluent quality while resulting in minimal disruption for the surrounding local environment.

   c. Financial: The monthly sewer user rate for the City of Jackson is estimated to be $35.58 per 5,000 gallons used.

2. Secondary:
   a. Population Impacts: The City of Jackson anticipates no significant change in population trends, no significant relocation of people or structures, and no new areas served by this project.

   b. Land use and Trends: The City of Jackson anticipates no significant change in land use trends and no development of sensitive areas resulting from this project.

   c. Environmental: The City of Jackson does not expect secondary environmental impacts caused by this project.

3. Mitigation Measures Necessary to Eliminate Adverse Environmental Effects: Best Management Practices and good engineering practices should minimize noise, blowing dust, and erosion normally associated with construction. The City of Jackson will promptly restore disturbed areas. To minimize impact to bat species in the region, if tree clearing is required for the project, the timeframe for clearing will be limited to between November 1 and March 31 per the guidelines of the U.S. Fish and Wildlife Service.

4. Irreversible and Irretrievable Commitment of Resources: Fuel and construction materials will be irretrievably committed to this project. Future funds will be committed to the operation and maintenance of the system.

PUBLIC PARTICIPATION:

1. Public Involvement: The City of Jackson held a public meeting on July 15, 2024, at City Hall, 101 Court Street, Jackson, MO, 63755.

2. Public Opposition or Opinions: The public expressed no adverse opinions to the project.

COORDINATION AND DOCUMENTATION WITH OTHER AGENCIES AND SPECIAL INTEREST GROUPS:

1. Facility Plan Dated: February 28, 2017, and Addendum Dated July 6, 2022
   Prepared By: Horner & Shifrin

   Environmental Assessment: September 12, 2023
   Prepared By: Environmental Data Services

2. Federal:
   a. U.S. Fish and Wildlife Service
   b. U.S. Army Corps of Engineers

3. State:
   a. Missouri DNR – State Historic Preservation Office
   b. Missouri Department of Conservation
   c. Missouri Office of Administration – Federal Assistance Clearinghouse

4. Consulting Engineer: Horner & Shifrin
   401 South 18th Street, Suite 400
   St. Louis, MO 63103-2296

5. In accordance with the National Historic Preservation Act Section 106, notice was given to all tribes that may attach a religious or cultural significance to historic properties in the region that may be affected by this undertaking.

Positive Environmental Effects to be Realized from the Proposed Project: Upgrades to the facility will improve the overall effluent quality of the Jackson WWTF while minimizing potential impacts to the surrounding environment.

Reasons for Concluding There Will Be No Significant Impacts: The proposed project will have a positive impact on water quality and will not result in any significant adverse impacts on rare or endangered species, floodplains, wetlands, recreational areas, cultural/archaeological sites, or air quality. Population densities and land use trends will not be significantly affected. Appropriate mitigation measures will be implemented for minor impacts, which are expected to be temporal in nature.

This action is taken on the basis of a careful review of the facility plan and supporting documentation on file in the office of the Missouri Department of Natural Resources' Financial Assistance Center at 1101 Riverside Drive, Jefferson City, MO 65101. These are available for public review upon request Monday-Friday, 8:00 a.m. to 5:00 p.m. This agency will not take any administrative action on this project for at least 30 calendar days from the date of this document. Persons wishing to comment on the above environmental decision may submit comments to Joshua Brown, P.E. of the Missouri Department of Natural Resources, Financial Assistance Center, P.O. Box 176, Jefferson City, MO 65102-0176, during this period. E-mail comments will be accepted at the following address: DNR.SRFPublicNotice@dnr.mo.gov. Please include the project name and number in all comment letters. Thank you.

Sincerely,

FINANCIAL ASSISTANCE CENTER

Lauren Graessle, P.E.
Director

Joshua Brown, P.E.
Technical Reviewer

February 18, 2025
Date

LG:jbc

Attachments

DISTRIBUTION

Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65102

Conservation Federation of Missouri
728 West Main Street
Jefferson City, MO 65101

U.S. Environmental Protection Agency
c/o Carter Tharp – WWPD/SRFB
Email: tharp.carter@epa.gov

Missouri Department of Natural Resources
Missouri Geological Survey
Environmental Geology Section
P.O. Box 250
Rolla, MO 65402-0250

Missouri Department of Natural Resources
Division of State Parks
State Historic Preservation Office
P.O. Box 176
Jefferson City, MO 65102-0176

U.S. Fish and Wildlife Service
Ecological Services
101 Park DeVille Drive, Suite A
Columbia, MO 65203-0057

National Park Service
Midwest Region
Email: mwro_compliance@nps.gov

USDA Rural Development
601 Business Loop 70 West
235 Parkade Center
Columbia, MO 65203

Gilmore and Bell, P.C.
c/o Shannon Walsh Creighton
One Metropolitan Square
211 N. Broadway, Suite 2000
St. Louis, MO 63102-2741

SRF File C295839-01

City of Jackson
c/o Janet Sanders
Director of Public Works
101 Court Street
Jackson, MO 63755-1807

Horner Shifrin
c/o Ed Sewing, P.E.
401 South 18th Street, Suite 400
St. Louis, MO 63103-2296

Missouri Department of Natural Resources
Southeast Regional Office
2155 North Westwood Blvd.
Poplar Bluff, MO 63901

The Cash-Book Journal
210 West Main Street
P.O. Box 369
Jackson, MO 63755

Environmental Protection Agency
Office of Federal Activities
Ariel Rios (2252A)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004

Council of Environmental Quality
722 Jackson Place, N.W.
Washington, DC 20503

U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, MO 63103

Southeast Missouri Regional Planning Commission
1 West St. Joseph Street
P.O. Box 366
Perryville, MO 63775

Lewis Rice
c/o David Brown
600 Washington Avenue, Suite 2500
St. Louis, MO 63101

Absentee-Shawnee Tribe of Indians of Oklahoma
c/o Devon Frazier
Tribe Historic Preservation Officer
2025 South Gordon Cooper Drive
Shawnee, OK 74801

Apache Tribe of Oklahoma
c/o Darrin Cisco
Tribe Historic Preservation Officer
E-mail: darrin.cisco@apachetribe.org

Cherokee Nation
c/o Elizabeth Toombs
Tribe Historic Preservation Officer
E-mail: elizabeth-toombs@cherokee.org

Delaware Nation
c/o Carissa Speck
Historic Preservation Director
E-mail: cspeck@delawarenation-nsn.gov

Delaware Tribe of Indians
c/o Susan Bachor
Historic Preservation Officer
E-mail: sbachor@delawaretribe.org

Eastern Shawnee Tribe of Oklahoma
c/o Rhonda Barnes
Acting Tribe Historic Preservation Officer
E-mail: THPO@estoo.net

Iowa Tribe of Kansas and Nebraska
c/o Lance M. Foster
Tribe Historic Preservation Officer
E-mail: lfoster@iowas.org

Iowa Tribe of Oklahoma
c/o Candace Pershall
E-mail: cpershall@iowanation.org

Miami Tribe of Oklahoma
c/o Logan York
Tribe Historic Preservation Officer
E-mail: thpo@miamination.com

Osage Nation
c/o Dr. Andrea A Hunter
Tribe Historic Preservation Officer
E-mail: s106@osagenation-nsn.gov

Peoria Tribe of Indians of Oklahoma
c/o Burgundy Fletcher
Historic Preservation Specialist
E-mail: bfletcher@peoriatribe.com

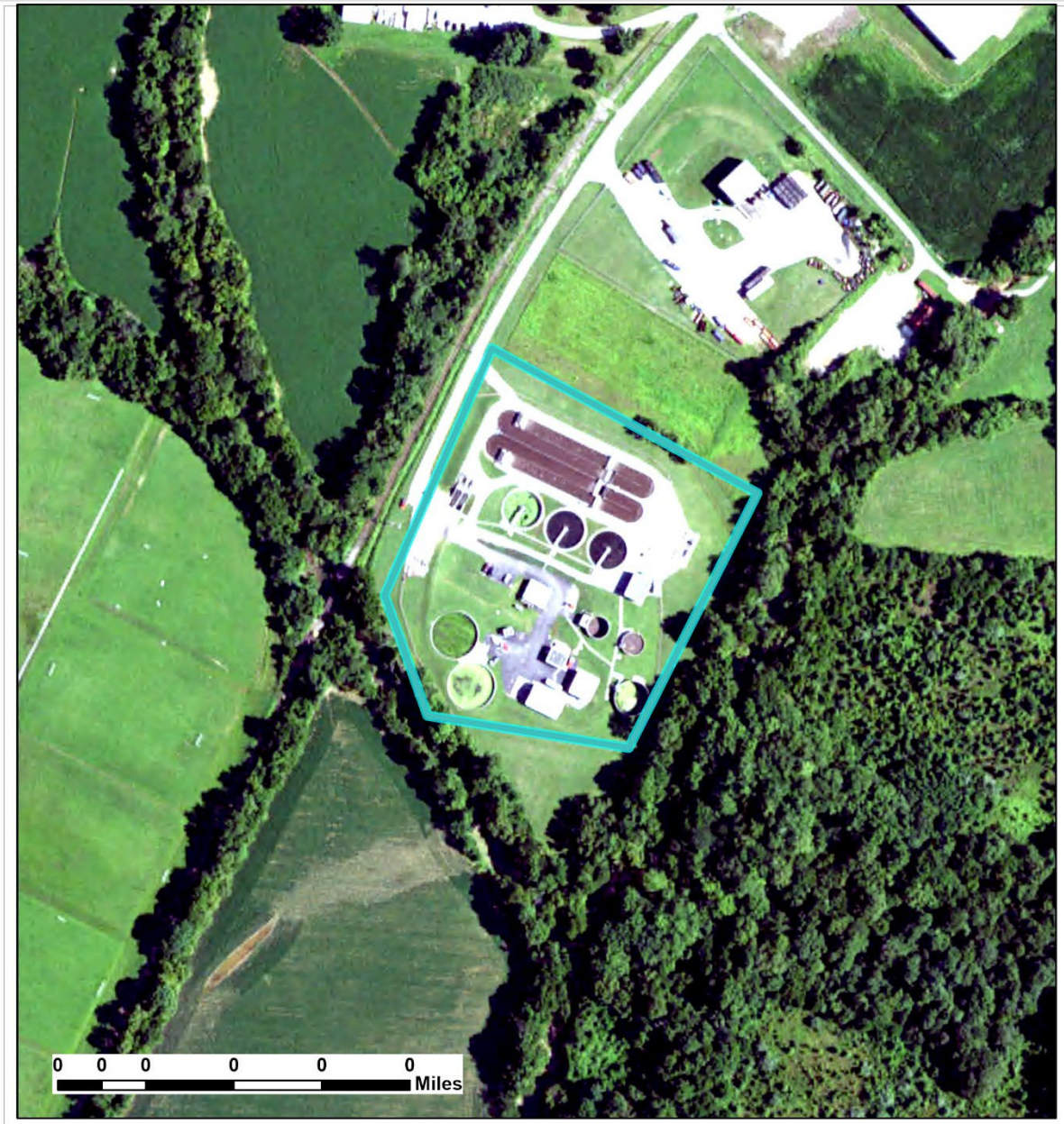
Ponca Tribe of Nebraska
c/o Theresa Foley
Tribe Historic Preservation Officer
E-mail: tfoley@poncatribe-ne.org

Ponca Tribe of Oklahoma
c/o Liana Hesler
Tribe Historic Preservation Officer
E-mail: 106notifications@ponca-nsn.gov

Quapaw Tribe of Indians
c/o Everett Bandy
Tribe Historic Preservation Officer
P.O. Box 765
Quapaw, OK 74363-0765

Shawnee Tribe
c/o Rosanna Dobbs
E-mail: rosanna@shawnee-tribe.com

United Keetoowah Band of Cherokee Indians of Oklahoma
c/o Acee Watt
Tribe Historic Preservation Officer
E-mail: ukbthpo@ukb-nsn.gov



Jackson WWTF

MISSOURI DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Financial Assistance Center